



Conditional Firm Inventory Methodology, Version 4

Effective: 06/22/12

This Business Practice describes the methodology that BPA Transmission Services will use to calculate its **Conditional Firm Inventory**¹ (CF Inventory).

This revision describes the process for increasing the CF Inventory when there is insufficient CF Inventory at one or more Flowgates to continue making **CFS**² available.

Version 4 includes the following changes:

Section B

- Step 5: Added "and Third" and changed CF to "CFS"

Section C

- Step C.7: Added "for network CFS offers and 800 hours for CFS offers with a **Subgrid**³ issue"

Section D

- Added Section D describing how the third increment of CF Inventory will be calculated.

Section F

- Step F.1 and F.2: Changed Path Utilization Factor (PUF) to "**Power Transfer Distribution Factor**⁴ (**PTDF**⁵)"

Section G

¹The number of megawatts (MW) available for providing CF Transmission Service at each Flowgate.

²Conditional Firm Transmission Service

³Any facilities on the interconnected transmission system that do not, by themselves, make up one of the monitored Flowgates e.g., lines, transformers, or substations.

⁴Power Transfer Distribution Factor (PTDF) Calculation: An equation based on a POD, POR and Transmission Demand used to determine the impacts to Network Flowgates. (POR PTDFa - POD PTDFa) * Transmission Demand = impact to Flowgates

⁵Power Transfer Distribution Factor (PTDF) Calculation: An equation based on a POD, POR and Transmission Demand used to determine the impacts to Network Flowgates. (POR PTDFa - POD PTDFa) * Transmission Demand = impact to Flowgates

- Revised Related Documents section
- Renamed form to "Specifications for Conditional Firm Point-to-Point Transmission Service"

A. Background

1. In March, 2005 BPA co-sponsored a technical conference with Federal Energy Regulatory Commission (FERC) on [Conditional Firm Transmission Service \(CFS\)](#)¹.
2. Order 890, released by FERC on February 16, 2007, requires transmission providers to study the provision of CF Transmission Service upon [Customer](#)² request. Order 890-A, released by FERC on January 16, 2008, reiterated that requirement. Order 890 left it up to the Transmission Provider to develop a method to determine how much transmission could be sold over a [Flowgate](#)³.
3. BPA Transmission Services added CFS to its Open Access Transmission Tariff (OATT) filed on October 3, 2008.
4. BPA Transmission Services started offering CFS on February 17, 2009.

B. CF Inventory Methodology - First Increment

1. BPA Transmission Services bases the first increment of its CF Inventory Methodology on the use of [Frequency Distribution Data](#)⁴ for each Flowgate.
2. Following is a step-by-step explanation of how BPA Transmission Services will calculate the first increment of CF Inventory for each Flowgate:
 - a. Determine the relevant period of time for which to examine Frequency Distribution Data. This decision is based on the extent of changes to the transmission system topology and addition of new generation.

¹Long-Term Firm (LTF) Point-to-Point Transmission Service subject to the conditions described in sections 15.4 and 28.7 of the OATT and Transmission Services' Business Practices

²Any customer taking service under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), Part II or Part III of the OATT.

³Flowgate (Cutplane): Transmission lines and facilities owned by BPA on a constrained portion of BPA's internal network transmission grid or transmission lines and facilities owned by BPA and one or more neighboring transmission providers that are interconnected and the separately owned facilities are operated in parallel in a coordinated manner, and each of the owners has an agreed upon allocated share of the transfer capability.

⁴A table depicting the percentage of time, in a defined period, that unused capacity was at or above a certain percentage.

- b. Use data for as many years as possible for which the system topology is similar enough to current system topology to make such data useful. If BPA Transmission Services can correct data for changes in system topology, data from years prior to the change in system topology will still be used in the CF Inventory calculation. These decisions are at BPA Transmission Services' discretion.
- c. Calculate the Operational Transfer Capability (OTC) minus **Actual Flow**¹ for each five minute increment during Heavy Load Hours (HLH) of the Flowgate's peak period (Unused Capacity Snapshot).
- d. Create a table of the Unused Capacity Snapshot ranking the data from the highest value to the lowest value.
- e. Create the Frequency Distribution Data array that depicts the amount of capacity that goes unused X% of the time. The resulting format looks like this:

Unused capacity by Flowgate (based on HLHs in Flowgate's peak season)		
Cumulative Percentage	Flowgate X	Flowgate Y
100%	3 MW or more	17 MW or more
99%	151 MW or more	287 MW or more
98%	230 MW or more	378 MW or more
97%	288 MW or more	426 MW or more

- f. Long-term firm transmission service reservations that will commence service on a future date will not be reflected in the Frequency Distribution Data. BPA Transmission Services will determine the impact on each flowgate from these long-term firm transmission service reservations.
3. The first increment of CF Inventory for the Flowgate is determined by the number of MWs that are unused at least 97% of the time during the peak season's HLHs less the impact of future service agreements on that Flowgate.
 - a. In the example data above, assume the impact of future service agreements on Flowgate X is 41 MW and on Flowgate Y is 12 MW, and the CF Inventory for Flowgate X would be 247 MW (288 MW - 41 MW). The CF Inventory for Flowgate Y would be 414 MW (426 MW - 12 MW).

¹The amount of megawatts (MW) of energy flowing over a Flowgate during a specific period in time. For purposes of the Conditional Firm Inventory Methodology, Supervisory Control and Data Acquisition (SCADA) data is a snapshot measurement at the end of every fifth minute.

4. BPA Transmission Services maintains the right to adjust the Total Transfer Capability at any time which would result in a change to the first increment of CF Inventory.
5. Once the CF Inventory at a Flowgate associated with this first increment is used up, additional CF Inventory at that Flowgate will be calculated consistent with the Second and Third Increment sections below. The hours of curtailment per year associated with the first increment will generally be 200 hours for network CFS offers and 400 hours for CFS offers with a Subgrid issue. For each CFS offer, BPA Transmission Services reserves the right to adjust the hours per year of curtailment of this first increment of CF Inventory as needed to minimize the risk associated with the CF Inventory.

C. CF Inventory Methodology - Second Increment

1. Once the first increment of CF Inventory is exhausted at a particular Flowgate, BPA Transmission Services calculates additional CF Inventory using the second increment of its CF Inventory Methodology. BPA Transmission Services bases the second increment of its CF Inventory Methodology on the use of Frequency Distribution Data for each Flowgate.
2. Following is a step-by-step explanation of how BPA Transmission Services will calculate the second increment of CF Inventory for each Flowgate:
 - a. Determine the relevant period of time for which to examine Frequency Distribution Data. This decision is based on the extent of changes to the transmission system topology and addition of new generation.
 - b. Use data for as many years as possible for which the system topology is similar enough to current system topology to make such data useful. If BPA Transmission Services can correct data for changes in system topology, data from years prior to the change in system topology will still be used in the CF Inventory calculation. These decisions are at BPA Transmission Services' discretion.
 - c. Calculate the Operational Transfer Capability (OTC) minus Actual Flow for each five minute increment during Heavy Load Hours (HLH) of the Flowgate's peak period (Unused Capacity Snapshot).
 - d. Create a table of the Unused Capacity Snapshot ranking the data from the highest value to the lowest value.
3. Determine the MW value from the table that is exceeded 200 hours a year.
4. Since Frequency Distribution Data is historical information, it does not take into account firm service agreements that will commence service at a future date. BPA Transmission Services will determine the impact on each Flowgate from these service agreements.
5. The second increment of CF Inventory for a Flowgate is the MW value determined in step 3 above less the impact of future service agreements on that Flowgate.

6. BPA Transmission Services maintains the right to adjust the Total Transfer Capability at any time which would result in a change to the second increment of CF Inventory.
7. The hours of curtailment per year associated with the second increment will generally be 400 hours for network CFS offers and 800 hours for CFS offers with a Subgrid issue. For each CFS offer, BPA Transmission Services reserves the right to adjust the hours per year of curtailment of this second increment of CF Inventory as needed to minimize the risk associated with the CF Inventory.

D. CF Inventory Methodology - Third Increment

1. Once the first and second increments of CF Inventory are exhausted at a particular Flowgate, BPA Transmission Services calculates additional CF Inventory using the third increment of its CF Inventory Methodology. BPA Transmission Services bases the third increment of its CF Inventory Methodology on the use of Frequency Distribution Data for each Flowgate.
2. Following is a step-by-step explanation of how BPA Transmission Services will calculate the third increment of CF Inventory for each Flowgate:
 - a. Determine the relevant period of time for which to examine Frequency Distribution Data. This decision is based on the extent of changes to the transmission system topology and addition of new generation.
 - b. Use data for as many years as possible for which the system topology is similar enough to current system topology to make such data useful. If BPA Transmission Services can correct data for changes in system topology, data from years prior to the change in system topology will still be used in the CF Inventory calculation. These decisions are at BPA Transmission Services' discretion.
 - c. Calculate the Operational Transfer Capability (OTC) minus Actual Flow for each five minute increment during Heavy Load Hours (HLH) of the Flowgate's peak period (Unused Capacity Snapshot).
 - d. Create a table of the Unused Capacity Snapshot ranking the data from the highest value to the lowest value.
3. Determine the MW value from the table that is exceeded 300 hours per year.
4. Since Frequency Distribution Data is historical information, it does not take into account firm service agreements that will commence service at a future date. BPA Transmission Services will determine the impact on each Flowgate from these service agreements.
5. The third increment of CF Inventory for a Flowgate is the MW value determined in section 3 above less the impact of future service agreements on that Flowgate in section 4 above.
6. BPA Transmission Services maintains the right to adjust the Total Transfer Capability at any time which would result in a change to the third increment of CF Inventory.

7. The hours of curtailment per year associated with the third increment will generally be 600 hours for network CFS offers and 1200 hours for CFS offers with a Subgrid issue. For each CFS offer, BPA Transmission Services reserves the right to adjust the hours per year of curtailment of this third increment of CF Inventory as needed to minimize the risk associated with the CF Inventory.

E. Updating the CF Inventory Methodology

1. BPA Transmission Services will re-examine the Frequency Distribution Data annually to determine if there are any modifications to the CF Inventory. This may result in an increase or a decrease to the CF Inventory at one or more Flowgates.
2. BPA Transmission Services may modify the methodology for calculating CF Inventory if additional inventory needs to be made available. If this happens, BPA Transmission Services will share relevant data and seek Customer input prior to making any decision to modify the methodology for determining CF Inventory.

F. ATC Impacts of CFS Requests

1. The Power Transfer Distribution Factor (PTDF) Calculation for CFS is performed in the same manner as it is for LTF Transmission Service Requests. (see "[ATC¹](#) Impacts of Long-Term Firm Requests" on the [ATC Methodology](#) webpage).
2. If the PTDF Calculation reveals that there is not enough LTF ATC to provide service to the [TSR²](#) at one or more Flowgates and a CFS offer can be made consistent with the Conditional Firm Transmission Service Business Practice, the following will occur when such a TSR is CONFIRMED:
 - a. For all Flowgates for which LTF ATC is available, LTF ATC will be decremented.
 - b. For all Flowgates for which LTF ATC is not available, and CF Inventory is available, CF Inventory will be decremented.

G. Additional Information

Policy Reference

This business practice implements the following Sections of the OATT and the Transmission & Ancillary Service Rate Schedules (Rate Schedules).

- [OATT](#): Sections 13.6, 14.7, 15.4, 19.3, 28.3, 28.7

Related Documents

- Conditional Firm Transmission Service
- Impacts of Long-Term Firm Requests
- Available Transfer Capacity and Available Flowgate Capacity Methodologies for the Planning Time Period

Forms

- [Specifications for Conditional Firm Point-to-Point Transmission Service](#)

Version History

Version 4	06/22/12 Version 4 includes the following changes:Section B -Step 5: Added "and Third" and changed CF to "CFS"; Section C - Step C.7: Added "for network CFS offers and 800 hours for CFS offers with a Subgrid issue"; Section D- Added Section D describing how the third increment of CF Inventory will be calculated.;Section F-Step F.1 and F.2: Changed Path Utilization Factor (PUF) to "Power Transfer
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¹Available Transfer Capability

²Transmission Service Request

	Distribution Factor (PTDF)";Section G- Revised Related Documents section, Renamed form to "Specifications for Conditional Firm Point-to-Point Transmission Service"
Version 3	04/16/10 Version 3 includes the following changes: • Section 3 was modified to discuss how the first increment of CF Inventory will be calculated. o Added "first increment" to the title and steps 3.1, 3.2, 3.3, and 3.4 o Added "of future service agreements" to step 3.3.1 o Added a new step 3.5 • A new Section 4 was added to describe how the second increment of CF Inventory will be calculated. • Step 5.2 was modified to reflect the process for future changes to the CF Inventory.
Version 2	11/04/09 In developing the Conditional Firm Inventory, Transmission Services did not account for the impact of long-term firm transmission service reservations that commence service at a future date. Transmission Services has modified the Conditional Firm Inventory calculation to account for these future impacts on each flowgate. Version 2 updates the Conditional Firm Inventory calculation.
Version 1	02/25/09 In March, 2005 BPA co-sponsored a technical conference with Federal Energy Regulatory Commission (FERC) on CF Transmission Service. Order 890, released by FERC on February 16, 2007, requires transmission providers to study the provision of CF Transmission Service upon Customer request. Order 890-A, released by the FERC on January 16, 2008, reiterated that requirement. Order 890 left it up to the Transmission Provider to develop a method to determine how much transmission could be sold over a Flowgate. Transmission Services added CF Transmission Service to its Open Access Transmission Tariff (OATT) filed on October 3, 2008. Transmission Services started offering CF Transmission Service on February 17, 2009.